FIG.1

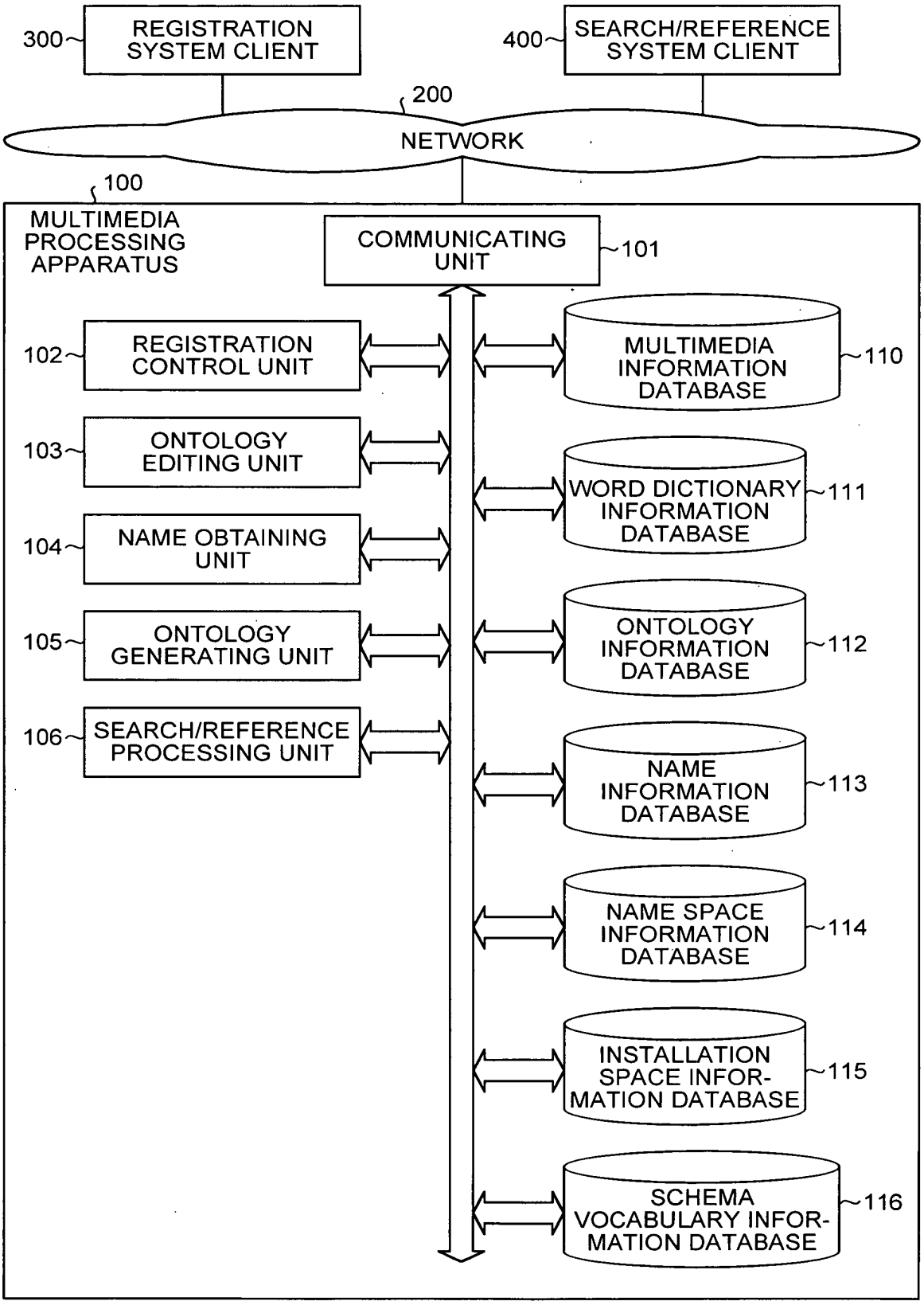

300
REGISTRATION SYSTEM CLIENT
400
SEARCH/REFERENCE SYSTEM CLIENT
200
NETWORK
100
MULTIMEDIA PROCESSING APPARATUS
COMMUNICATING UNIT
101
102
REGISTRATION CONTROL UNIT
103
ONTOLOGY EDITING UNIT
104
NAME OBTAINING UNIT
105
ONTOLOGY GENERATING UNIT
106
SEARCH/REFERENCE PROCESSING UNIT
MULTIMEDIA INFORMATION DATABASE
110
WORD DICTIONARY INFORMATION DATABASE
111
ONTOLOGY INFORMATION DATABASE
112
NAME INFORMATION DATABASE
113
NAME SPACE INFORMATION DATABASE
114
INSTALLATION SPACE INFOR-MATION DATABASE
115
SCHEMA VOCABULARY INFOR-MATION DATABASE
116

FIG.2

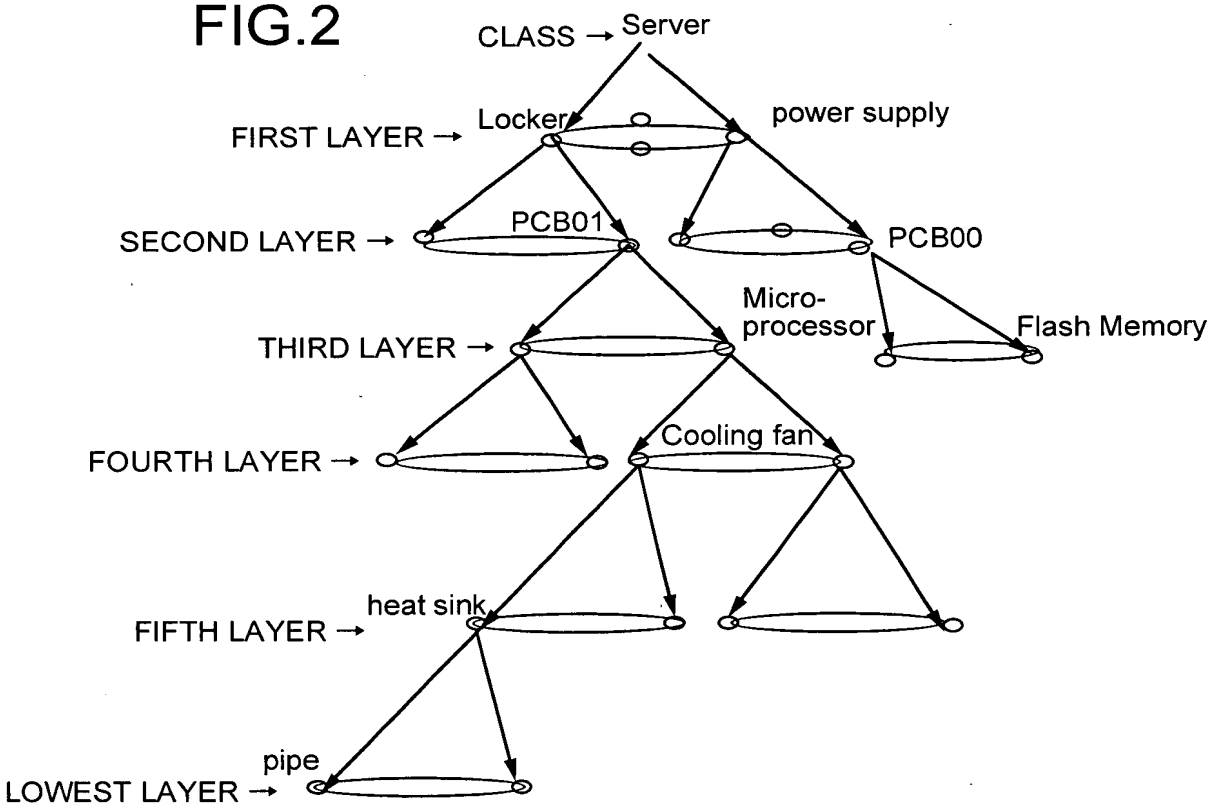

CLASS → Server
FIRST LAYER → Locker
power supply
SECOND LAYER → PCB01
PCB00
THIRD LAYER →
Micro-processor
Flash Memory
FOURTH LAYER →
Cooling fan
FIFTH LAYER →
heat sink
LOWEST LAYER →
pipe

FIG.3

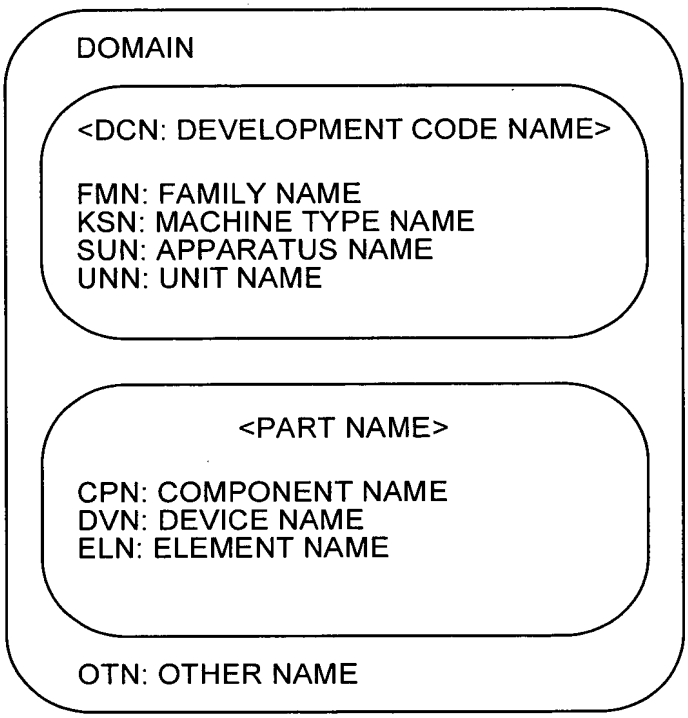

DOMAIN
<DCN: DEVELOPMENT CODE NAME>
FMN: FAMILY NAME
KSN: MACHINE TYPE NAME
SUN: APPARATUS NAME
UNN: UNIT NAME
<PART NAME>
CPN: COMPONENT NAME
DVN: DEVICE NAME
ELN: ELEMENT NAME
OTN: OTHER NAME

FIG.4

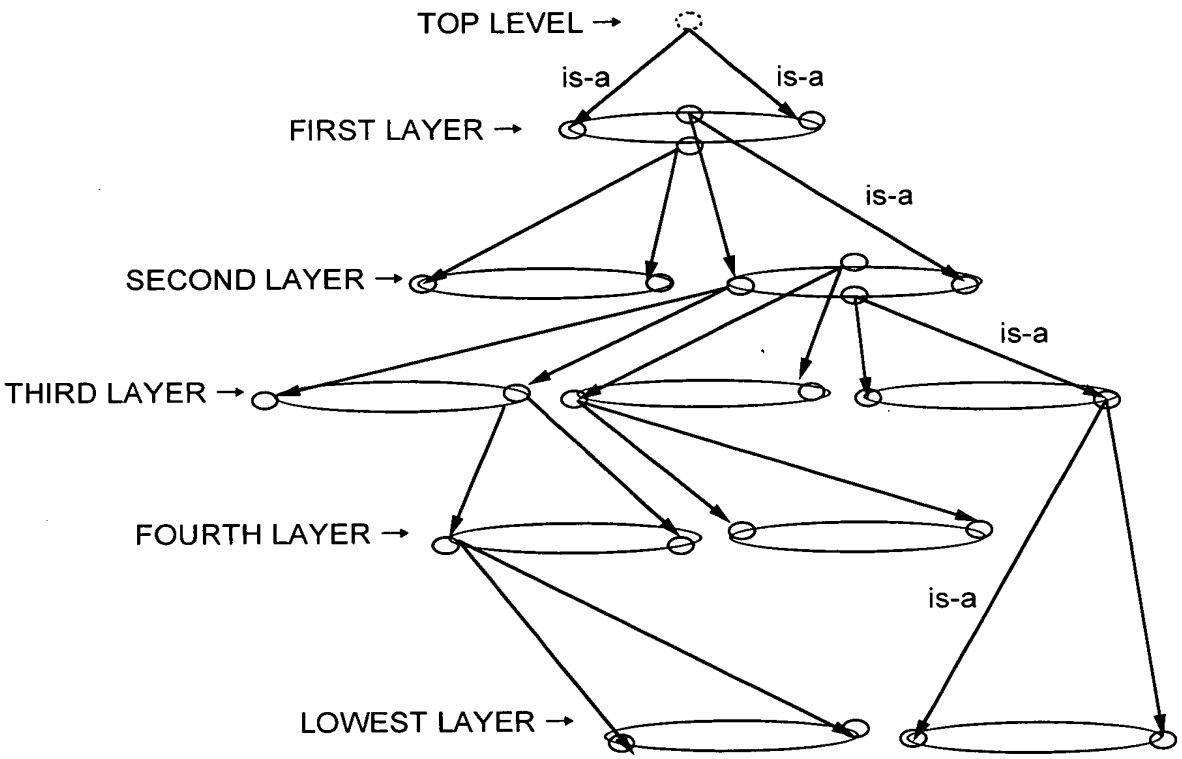

TOP LEVEL
is-a
is-a
FIRST LAYER
is-a
SECOND LAYER
is-a
THIRD LAYER
FOURTH LAYER
is-a
LOWEST LAYER

FIG.5

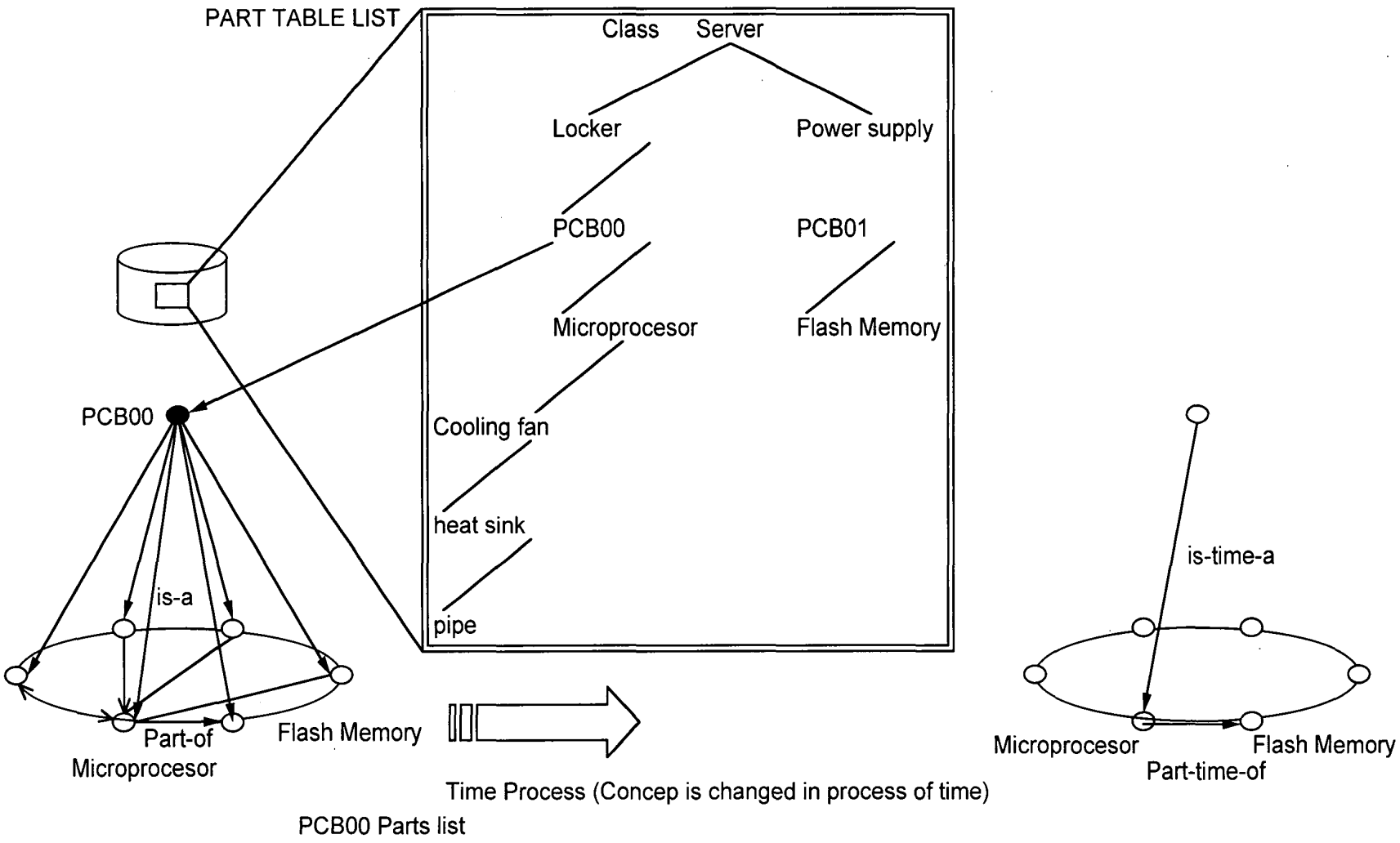

PART TABLE LIST
Class
Server
Locker
Power supply
PCB00
PCB01
Microprocesor
Flash Memory
Cooling fan
heat sink
pipe
PCB00
is-a
Part-of
Microprocesor
Flash Memory
Time Process (Concep is changed in process of time)
PCB00 Parts list
is-time-a
Microprocesor
Flash Memory
Part-time-of

FIG.6

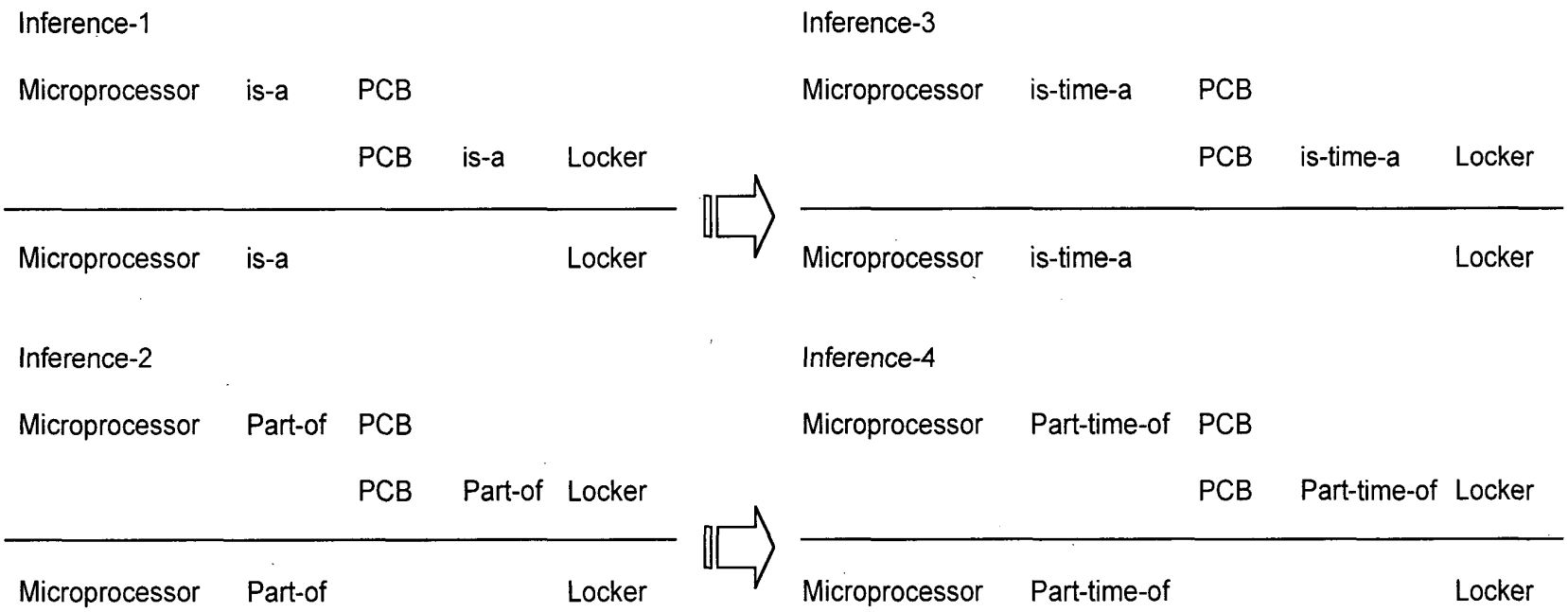

Inference-1
Microprocessor is-a PCB
PCB is-a Locker
Microprocessor is-a Locker
Inference-2
Microprocessor Part-of PCB
PCB Part-of Locker
Microprocessor Part-of Locker
Inference-3
Microprocessor is-time-a PCB
PCB is-time-a Locker
Microprocessor is-time-a Locker
Inference-4
Microprocessor Part-time-of PCB
PCB Part-time-of Locker
Microprocessor Part-time-of Locker

FIG.7

INSTALLATION NUMBER (POSITION)	PART NAME	MODEL NAME	MANUFACTURER NAME
⋮	⋮	⋮	⋮

FIG.8

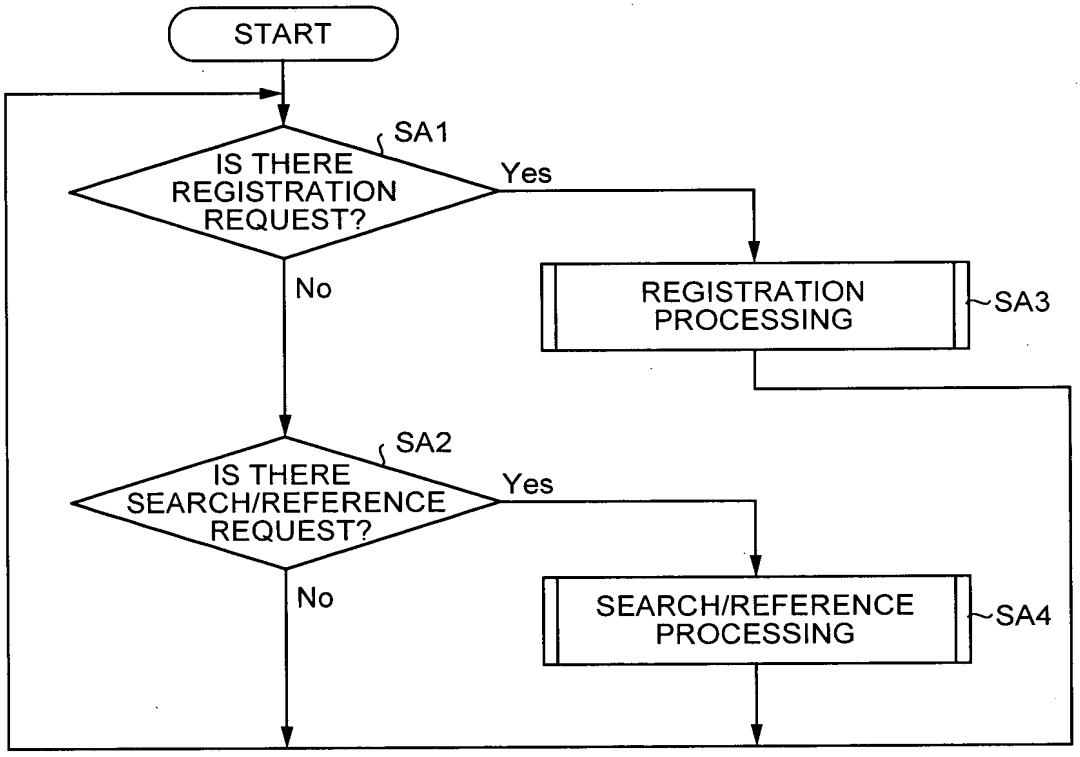


FIG.9

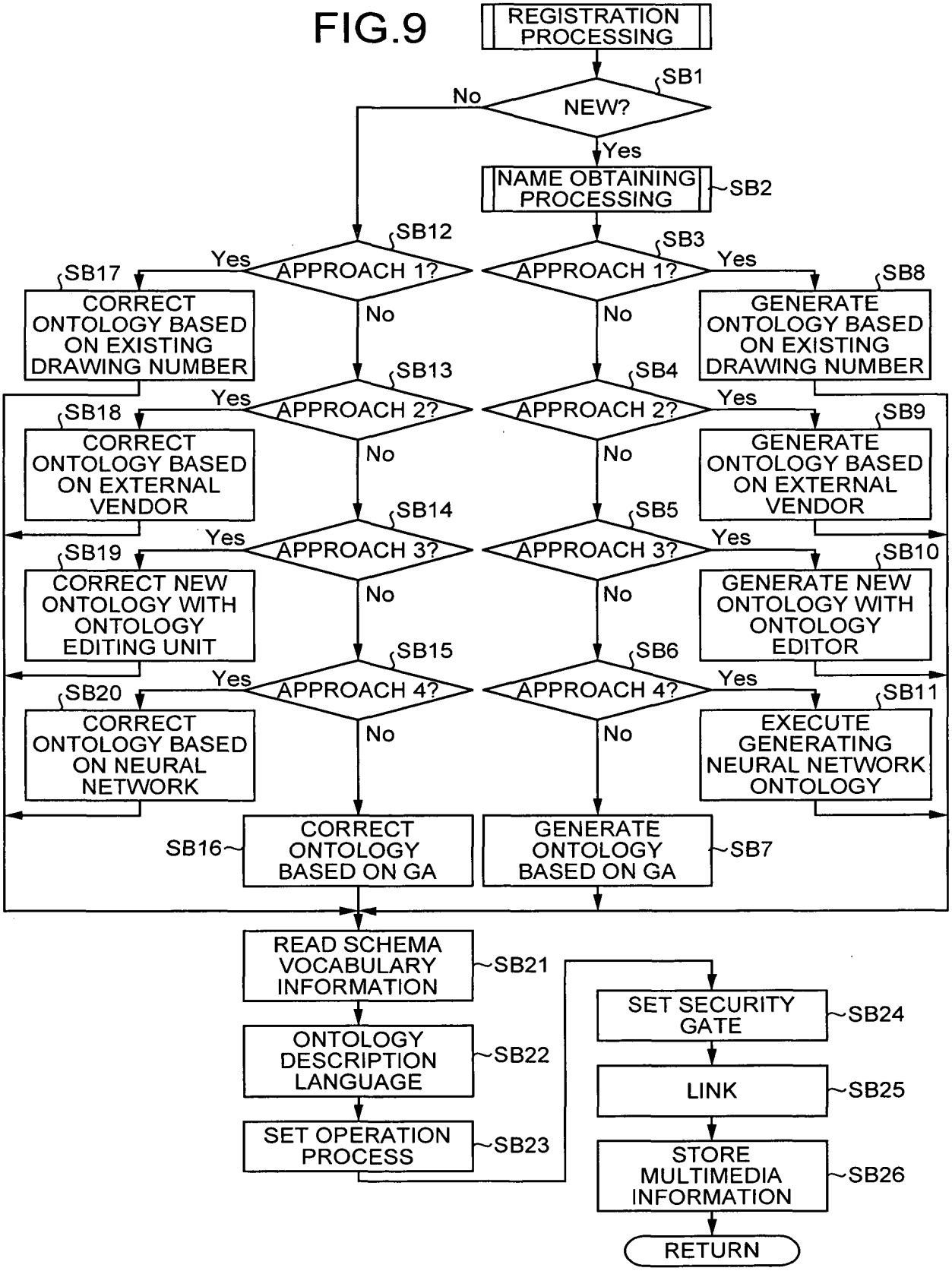

REGISTRATION PROCESSING
SB1
NEW?
No
Yes
NAME OBTAINING PROCESSING
SB2
SB12
APPROACH 1?
Yes
SB17
CORRECT ONTOLOGY BASED ON EXISTING DRAWING NUMBER
No
SB3
APPROACH 1?
Yes
SB8
GENERATE ONTOLOGY BASED ON EXISTING DRAWING NUMBER
No
SB13
APPROACH 2?
Yes
SB18
CORRECT ONTOLOGY BASED ON EXTERNAL VENDOR
No
SB4
APPROACH 2?
Yes
SB9
GENERATE ONTOLOGY BASED ON EXTERNAL VENDOR
No
SB14
APPROACH 3?
Yes
SB19
CORRECT NEW ONTOLOGY WITH ONTOLOGY EDITING UNIT
No
SB5
APPROACH 3?
Yes
SB10
GENERATE NEW ONTOLOGY WITH ONTOLOGY EDITOR
No
SB15
APPROACH 4?
Yes
SB20
CORRECT ONTOLOGY BASED ON NEURAL NETWORK
No
SB6
APPROACH 4?
Yes
SB11
EXECUTE GENERATING NEURAL NETWORK ONTOLOGY
No
SB16
CORRECT ONTOLOGY BASED ON GA
SB7
GENERATE ONTOLOGY BASED ON GA
READ SCHEMA VOCABULARY INFORMATION
SB21
ONTOLOGY DESCRIPTION LANGUAGE
SB22
SET OPERATION PROCESS
SB23
SET SECURITY GATE
SB24
LINK
SB25
STORE MULTIMEDIA INFORMATION
SB26
RETURN

FIG.10

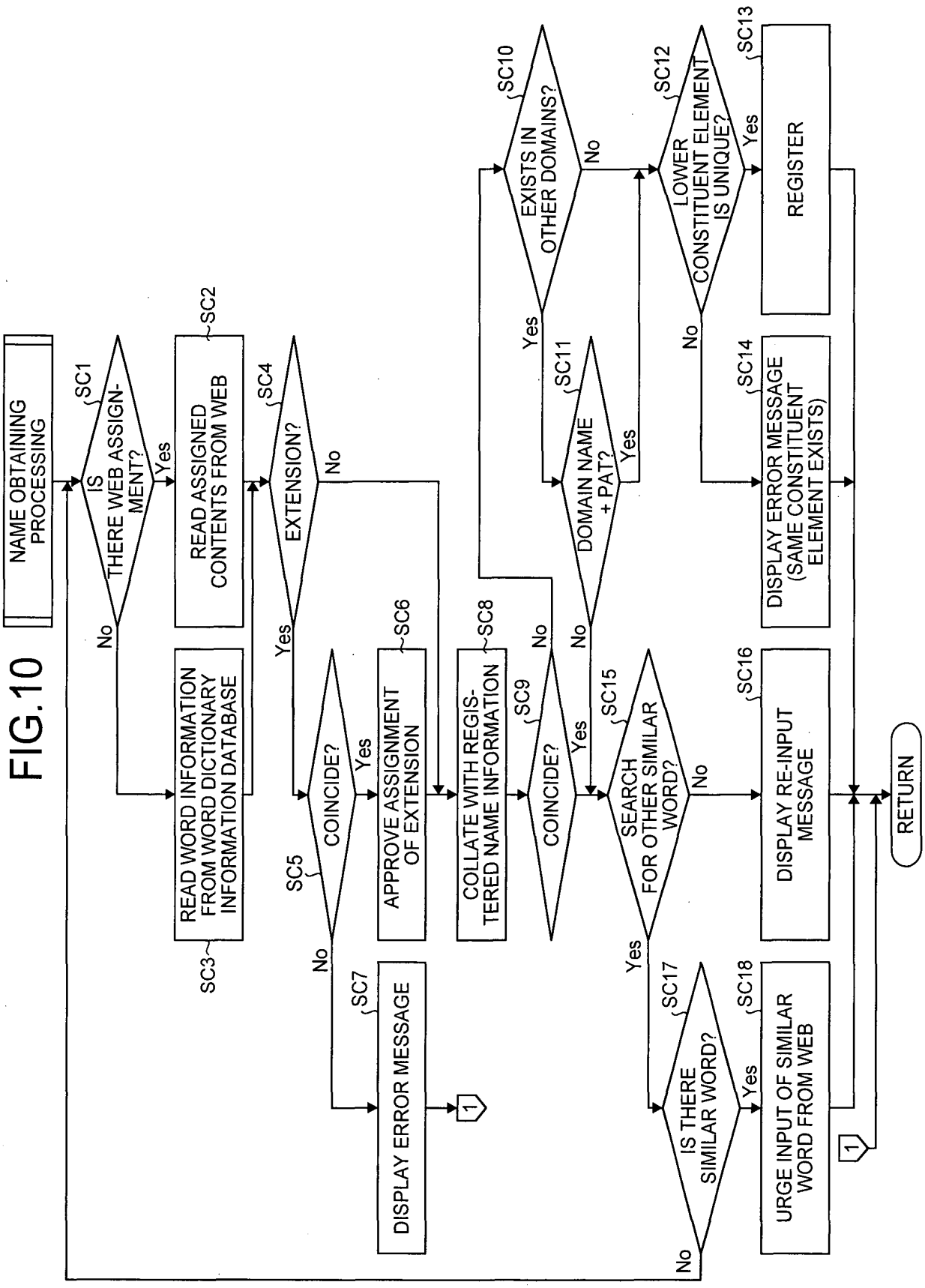

NAME OBTAINING PROCESSING
SC1
IS THERE WEB ASSIGN-MENT?
Yes
No
SC2
READ ASSIGNED CONTENTS FROM WEB
SC3
READ WORD INFORMATION FROM WORD DICTIONARY INFORMATION DATABASE
SC4
EXTENSION?
Yes
No
SC5
COINCIDE?
Yes
No
SC6
APPROVE ASSIGNMENT OF EXTENSION
SC7
DISPLAY ERROR MESSAGE
1
SC8
COLLATE WITH REGIS-TERED NAME INFORMATION
SC9
COINCIDE?
Yes
No
SC10
EXISTS IN OTHER DOMAINS?
Yes
No
SC11
DOMAIN NAME + PAT?
Yes
No
SC12
LOWER CONSTITUENT ELEMENT IS UNIQUE?
Yes
No
SC13
REGISTER
SC14
DISPLAY ERROR MESSAGE (SAME CONSTITUENT ELEMENT EXISTS)
SC15
SEARCH FOR OTHER SIMILAR WORD?
Yes
No
SC16
DISPLAY RE-INPUT MESSAGE
SC17
IS THERE SIMILAR WORD?
Yes
No
SC18
URGE INPUT OF SIMILAR WORD FROM WEB
1
RETURN

FIG.11

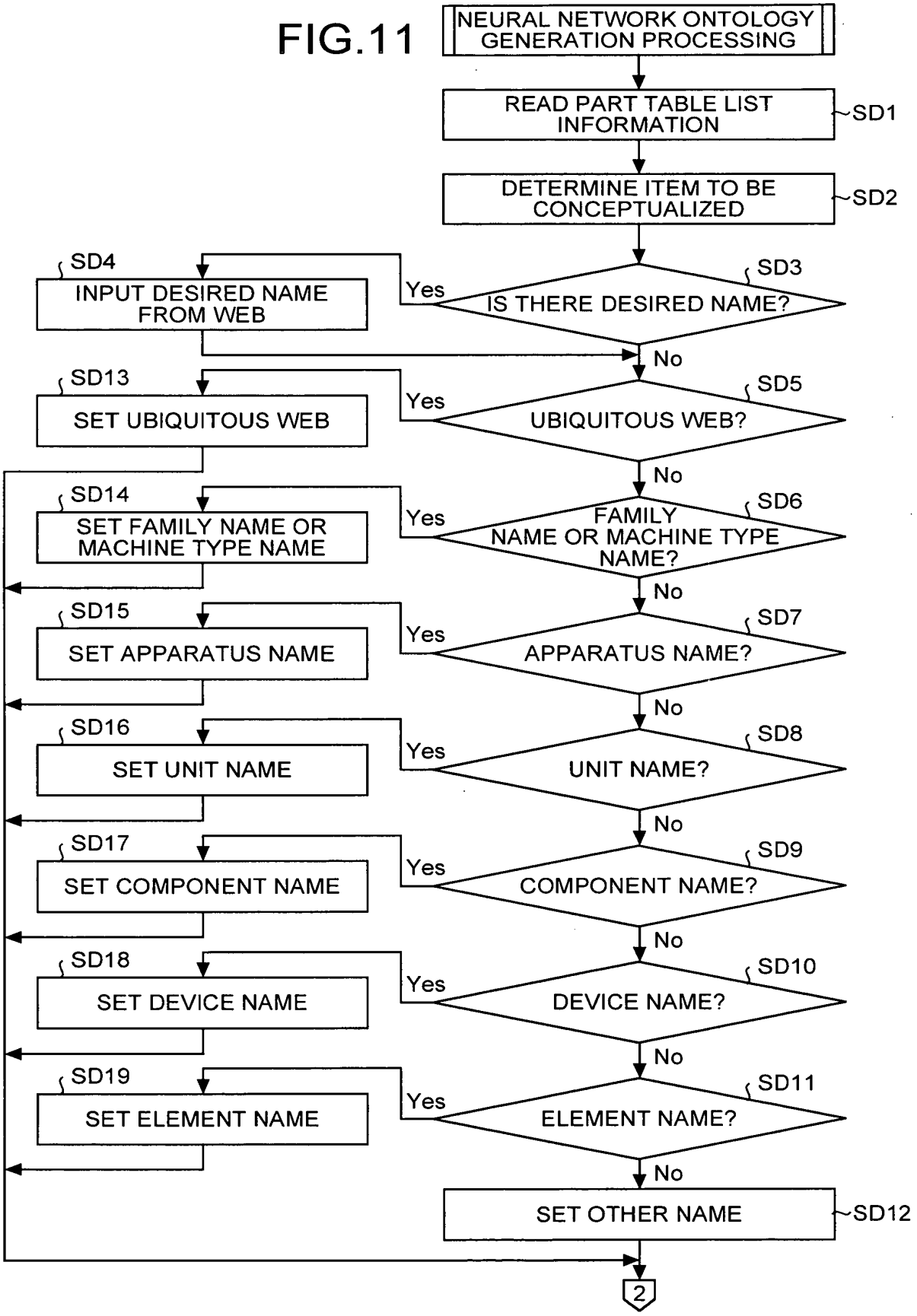

NEURAL NETWORK ONTOLOGY GENERATION PROCESSING
READ PART TABLE LIST INFORMATION
SD1
DETERMINE ITEM TO BE CONCEPTUALIZED
SD2
SD3
IS THERE DESIRED NAME?
Yes
SD4
INPUT DESIRED NAME FROM WEB
No
SD5
UBIQUITOUS WEB?
Yes
SD13
SET UBIQUITOUS WEB
No
SD6
FAMILY NAME OR MACHINE TYPE NAME?
Yes
SD14
SET FAMILY NAME OR MACHINE TYPE NAME
No
SD7
APPARATUS NAME?
Yes
SD15
SET APPARATUS NAME
No
SD8
UNIT NAME?
Yes
SD16
SET UNIT NAME
No
SD9
COMPONENT NAME?
Yes
SD17
SET COMPONENT NAME
No
SD10
DEVICE NAME?
Yes
SD18
SET DEVICE NAME
No
SD11
ELEMENT NAME?
Yes
SD19
SET ELEMENT NAME
No
SET OTHER NAME
SD12
2

FIG.12

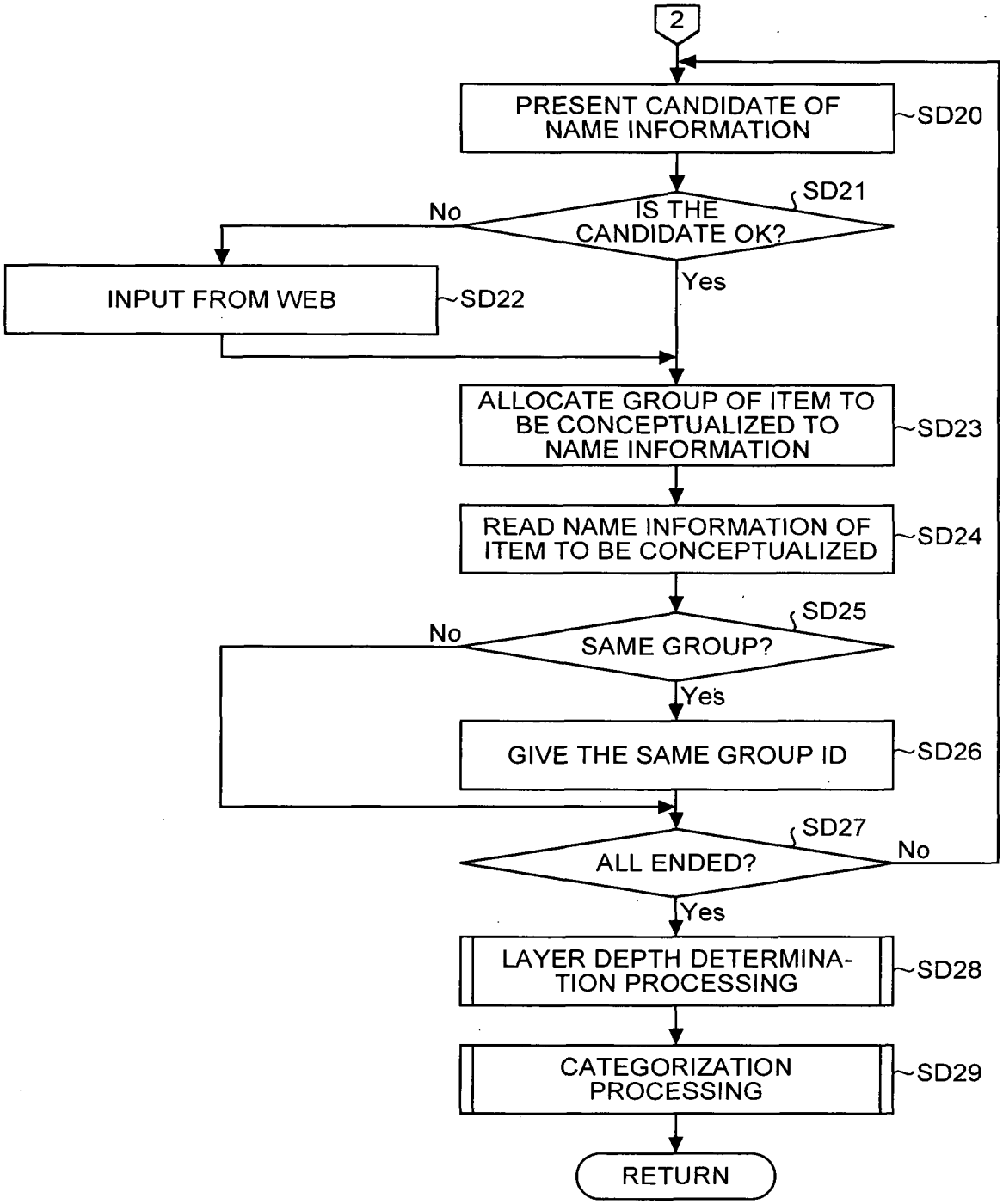

2
PRESENT CANDIDATE OF NAME INFORMATION
SD20
IS THE CANDIDATE OK?
SD21
No
Yes
INPUT FROM WEB
SD22
ALLOCATE GROUP OF ITEM TO BE CONCEPTUALIZED TO NAME INFORMATION
SD23
READ NAME INFORMATION OF ITEM TO BE CONCEPTUALIZED
SD24
SAME GROUP?
SD25
No
Yes
GIVE THE SAME GROUP ID
SD26
ALL ENDED?
SD27
No
Yes
LAYER DEPTH DETERMINATION PROCESSING
SD28
CATEGORIZATION PROCESSING
SD29
RETURN

FIG.13

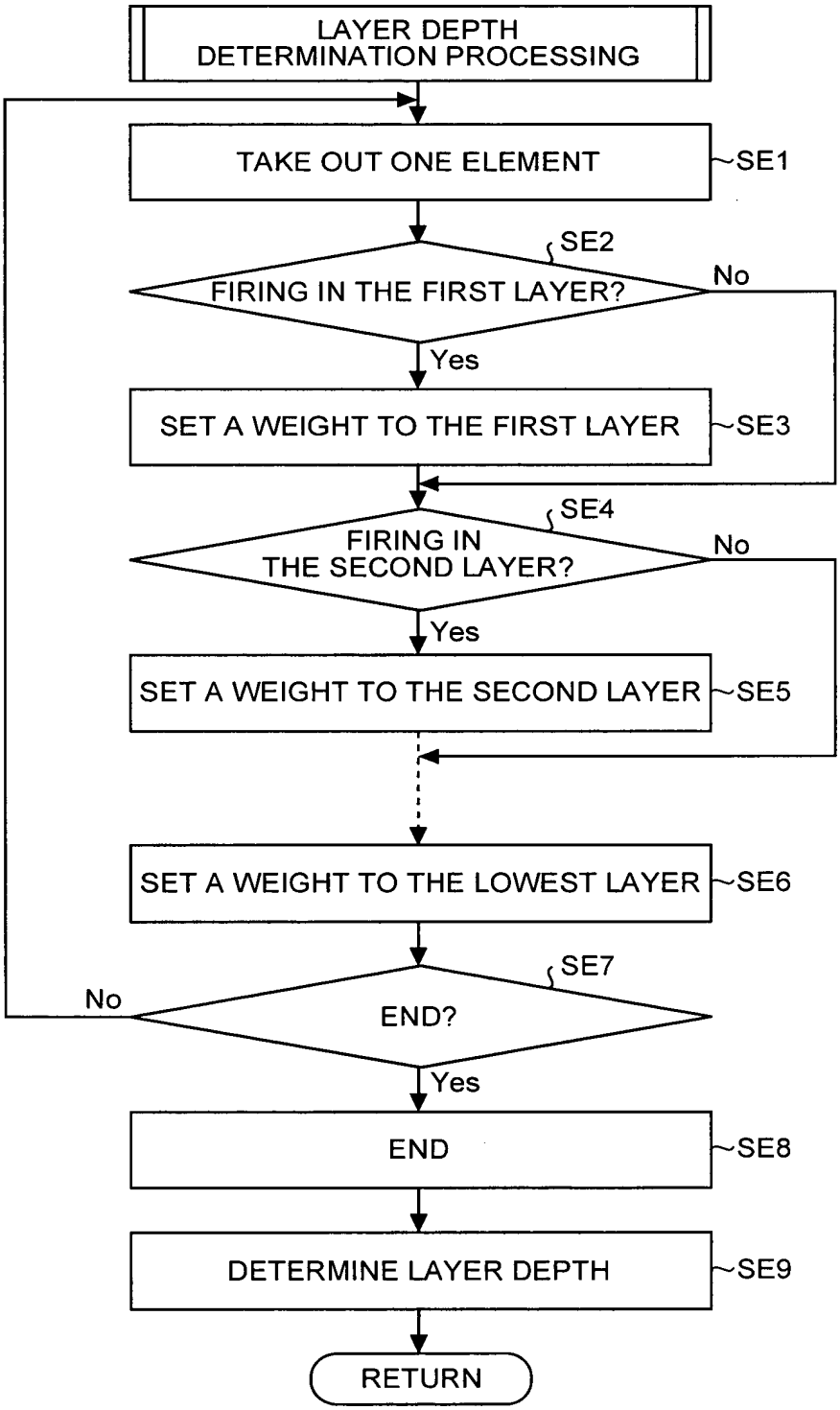

LAYER DEPTH DETERMINATION PROCESSING
TAKE OUT ONE ELEMENT
SE1
SE2
FIRING IN THE FIRST LAYER?
No
Yes
SET A WEIGHT TO THE FIRST LAYER
SE3
SE4
FIRING IN THE SECOND LAYER?
No
Yes
SET A WEIGHT TO THE SECOND LAYER
SE5
SET A WEIGHT TO THE LOWEST LAYER
SE6
SE7
No
END?
Yes
END
SE8
DETERMINE LAYER DEPTH
SE9
RETURN

FIG.14

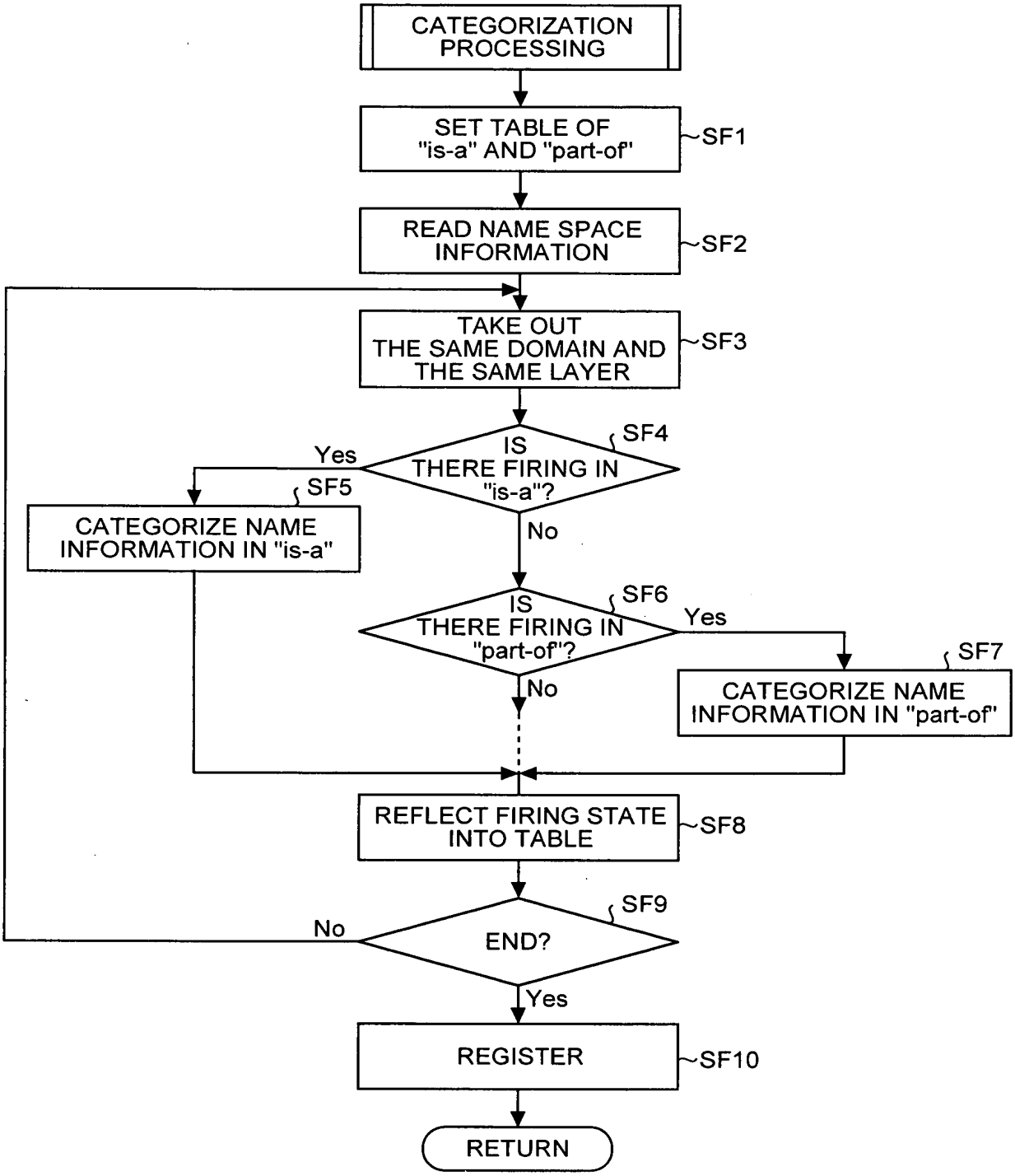

CATEGORIZATION PROCESSING
SET TABLE OF "is-a" AND "part-of'
SF1
READ NAME SPACE INFORMATION
SF2
TAKE OUT THE SAME DOMAIN AND THE SAME LAYER
SF3
IS THERE FIRING IN "is-a"?
SF4
Yes
SF5
CATEGORIZE NAME INFORMATION IN "is-a"
No
IS THERE FIRING IN "part-of'?
SF6
Yes
SF7
CATEGORIZE NAME INFORMATION IN "part-of'
No
REFLECT FIRING STATE INTO TABLE
SF8
END?
SF9
No
Yes
REGISTER
SF10
RETURN

FIG.15

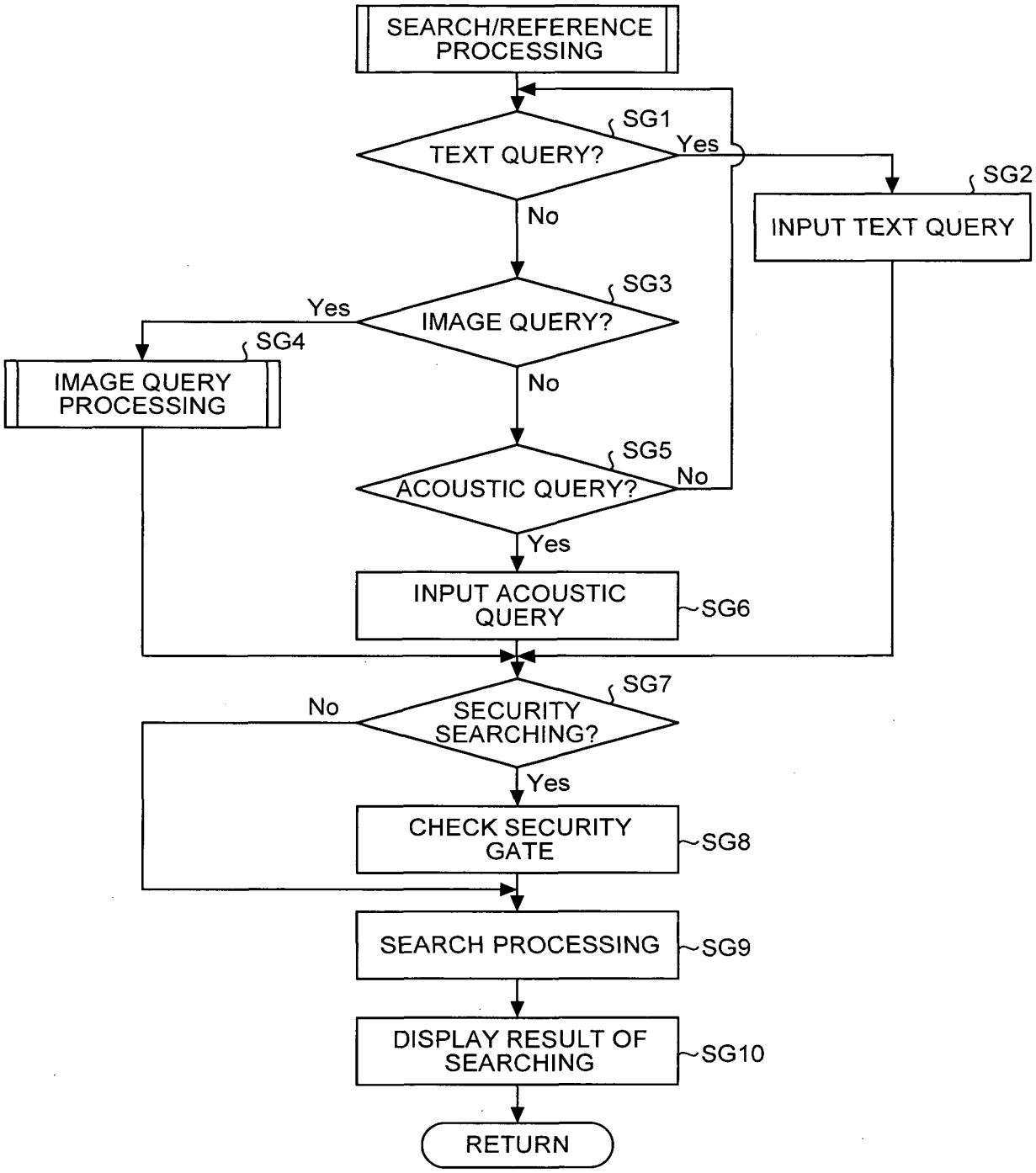

SEARCH/REFERENCE PROCESSING
SG1
TEXT QUERY?
Yes
SG2
INPUT TEXT QUERY
No
SG3
IMAGE QUERY?
Yes
SG4
IMAGE QUERY PROCESSING
No
SG5
ACOUSTIC QUERY?
No
Yes
INPUT ACOUSTIC QUERY
SG6
SG7
SECURITY SEARCHING?
No
Yes
CHECK SECURITY GATE
SG8
SEARCH PROCESSING
SG9
DISPLAY RESULT OF SEARCHING
SG10
RETURN

FIG.16

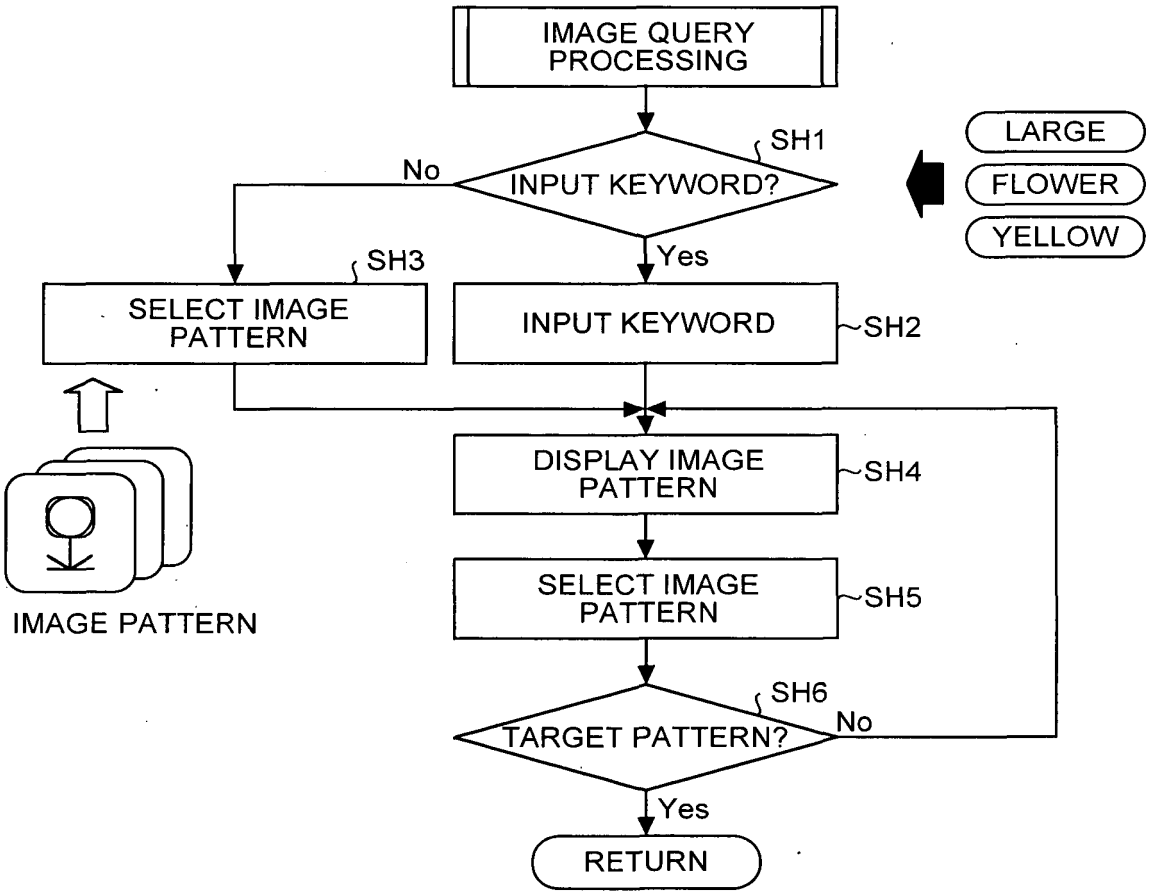


IMAGE QUERY PROCESSING
SH1
INPUT KEYWORD?
No
Yes
LARGE
FLOWER
YELLOW
SH3
SELECT IMAGE PATTERN
INPUT KEYWORD
SH2
IMAGE PATTERN
DISPLAY IMAGE PATTERN
SH4
SELECT IMAGE PATTERN
SH5
SH6
TARGET PATTERN?
No
Yes
RETURN

FIG.17

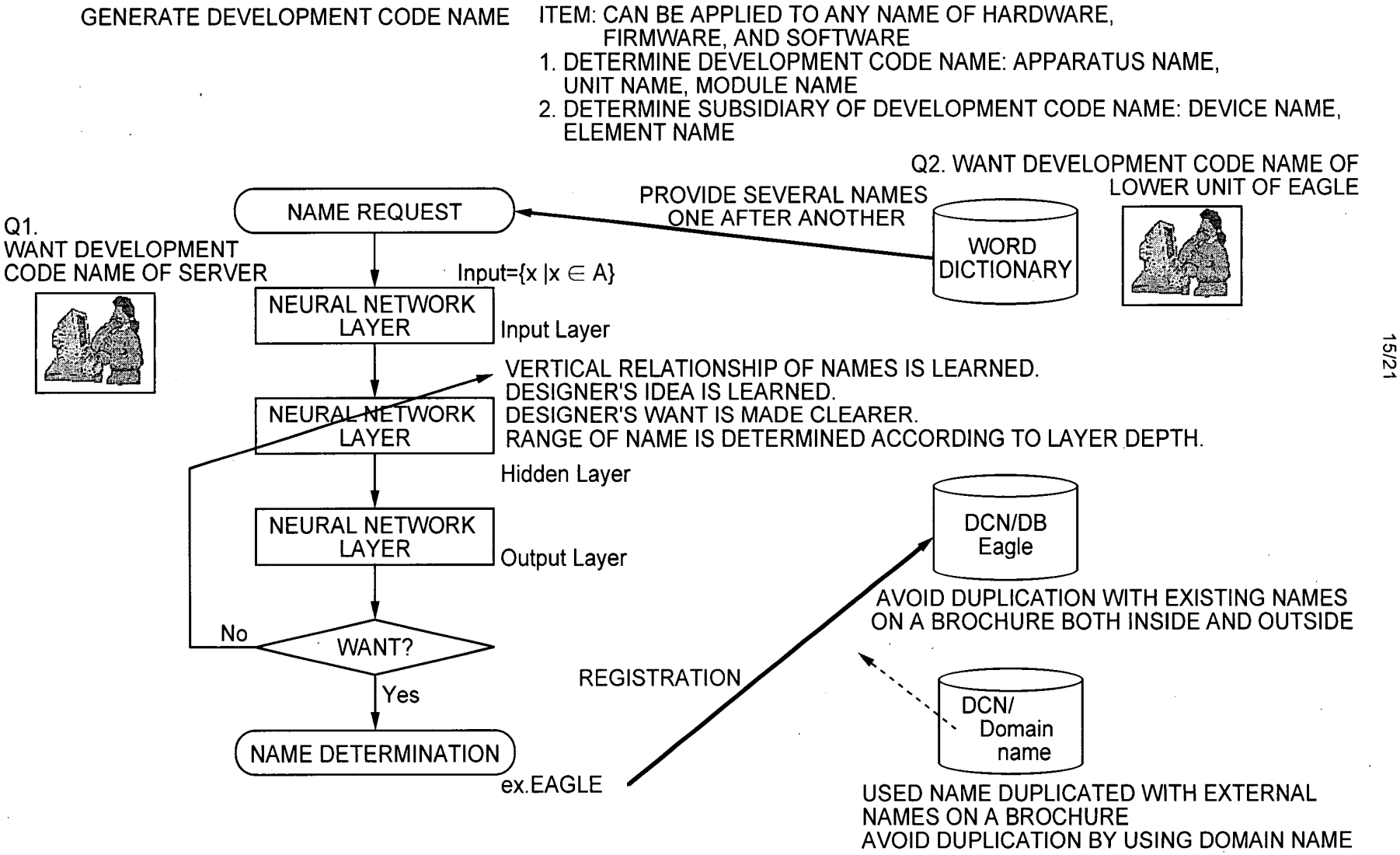

GENERATE DEVELOPMENT CODE NAME
ITEM: CAN BE APPLIED TO ANY NAME OF HARDWARE, FIRMWARE, AND SOFTWARE
1. DETERMINE DEVELOPMENT CODE NAME: APPARATUS NAME, UNIT NAME, MODULE NAME
2. DETERMINE SUBSIDIARY OF DEVELOPMENT CODE NAME: DEVICE NAME, ELEMENT NAME
Q2. WANT DEVELOPMENT CODE NAME OF LOWER UNIT OF EAGLE
PROVIDE SEVERAL NAMES ONE AFTER ANOTHER
NAME REQUEST
WORD DICTIONARY
Q1. WANT DEVELOPMENT CODE NAME OF SERVER
Input={x |x ∈ A}
NEURAL NETWORK LAYER
Input Layer
VERTICAL RELATIONSHIP OF NAMES IS LEARNED.
DESIGNER'S IDEA IS LEARNED.
DESIGNER'S WANT IS MADE CLEARER.
RANGE OF NAME IS DETERMINED ACCORDING TO LAYER DEPTH.
NEURAL NETWORK LAYER
Hidden Layer
NEURAL NETWORK LAYER
Output Layer
DCN/DB Eagle
AVOID DUPLICATION WITH EXISTING NAMES ON A BROCHURE BOTH INSIDE AND OUTSIDE
No
WANT?
Yes
REGISTRATION
DCN/ Domain name
NAME DETERMINATION
ex.EAGLE
USED NAME DUPLICATED WITH EXTERNAL NAMES ON A BROCHURE
AVOID DUPLICATION BY USING DOMAIN NAME

FIG.18

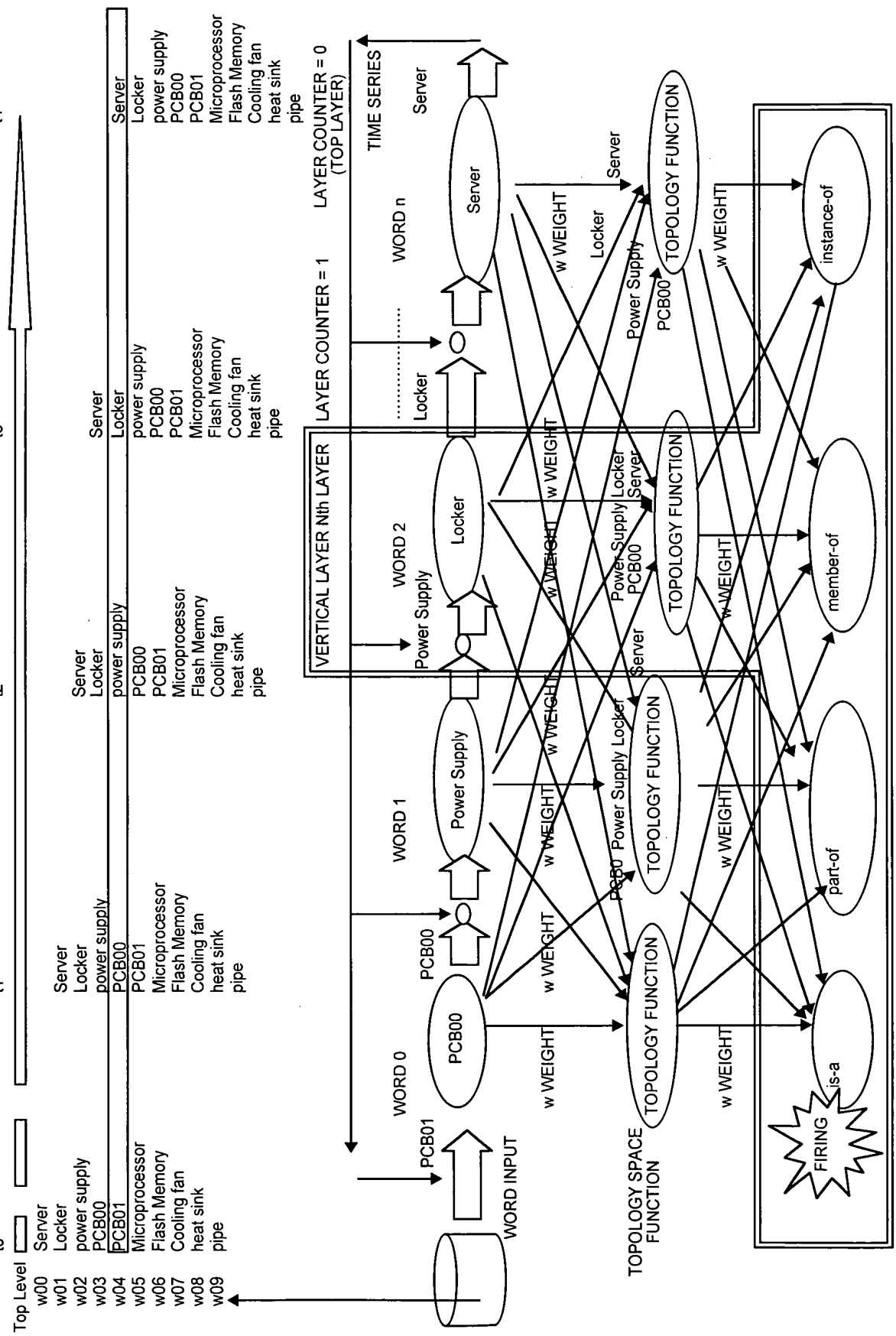

t0
t1
t2
t3
t4
Top Level
w00 Server
w01 Locker
w02 power supply
w03 PCB00
w04 PCB01
w05 Microprocessor
w06 Flash Memory
w07 Cooling fan
w08 heat sink
w09 pipe
Server
Locker
power supply
PCB00
PCB01
Microprocessor
Flash Memory
Cooling fan
heat sink
pipe
WORD INPUT
WORD 0
WORD 1
WORD 2
WORD n
VERTICAL LAYER Nth LAYER
LAYER COUNTER = 1
LAYER COUNTER = 0
(TOP LAYER)
TIME SERIES
w WEIGHT
TOPOLOGY SPACE FUNCTION
TOPOLOGY FUNCTION
FIRING
is-a
part-of
member-of
instance-of
LATERAL CLASSIFICATION

FIG.19

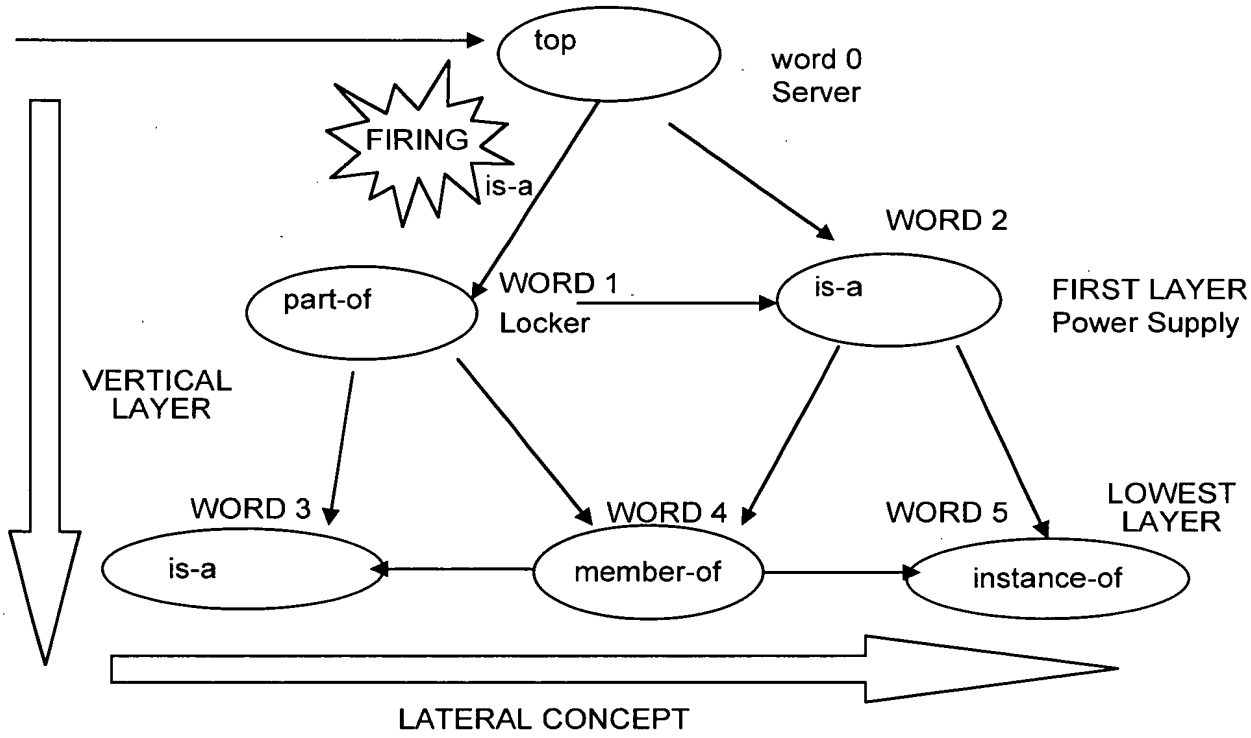

top
word 0
Server
FIRING
is-a
WORD 2
part-of
WORD 1
Locker
is-a
FIRST LAYER
Power Supply
VERTICAL
LAYER
WORD 3
WORD 4
WORD 5
LOWEST
LAYER
is-a
member-of
instance-of
LATERAL CONCEPT

FIG.20

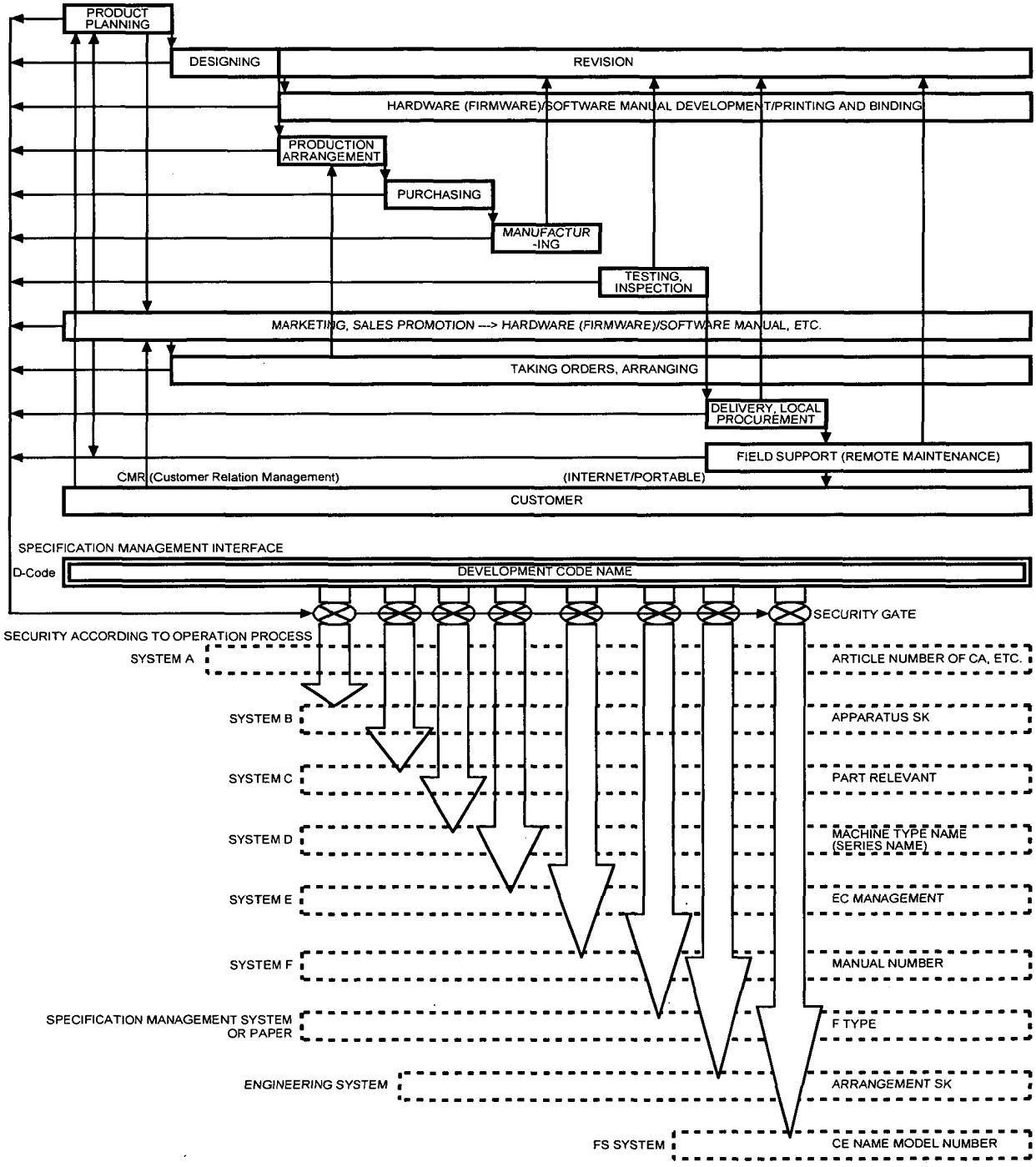

PRODUCT PLANNING
DESIGNING
REVISION
HARDWARE (FIRMWARE)/SOFTWARE MANUAL DEVELOPMENT/PRINTING AND BINDING
PRODUCTION ARRANGEMENT
PURCHASING
MANUFACTUR -ING
TESTING, INSPECTION
MARKETING, SALES PROMOTION ---> HARDWARE (FIRMWARE)/SOFTWARE MANUAL, ETC.
TAKING ORDERS, ARRANGING
DELIVERY, LOCAL PROCUREMENT
FIELD SUPPORT (REMOTE MAINTENANCE)
CMR (Customer Relation Management)
(INTERNET/PORTABLE)
CUSTOMER
SPECIFICATION MANAGEMENT INTERFACE
D-Code
DEVELOPMENT CODE NAME
SECURITY GATE
SECURITY ACCORDING TO OPERATION PROCESS
SYSTEM A
SYSTEM B
SYSTEM C
SYSTEM D
SYSTEM E
SYSTEM F
SPECIFICATION MANAGEMENT SYSTEM OR PAPER
ENGINEERING SYSTEM
FS SYSTEM
ARTICLE NUMBER OF CA, ETC.
APPARATUS SK
PART RELEVANT
MACHINE TYPE NAME (SERIES NAME)
EC MANAGEMENT
MANUAL NUMBER
F TYPE
ARRANGEMENT SK
CE NAME MODEL NUMBER

FIG.21

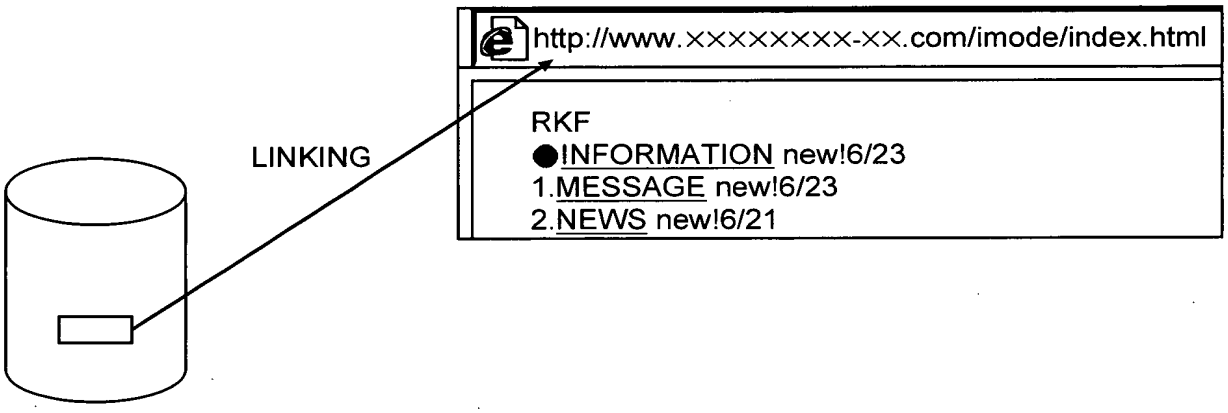
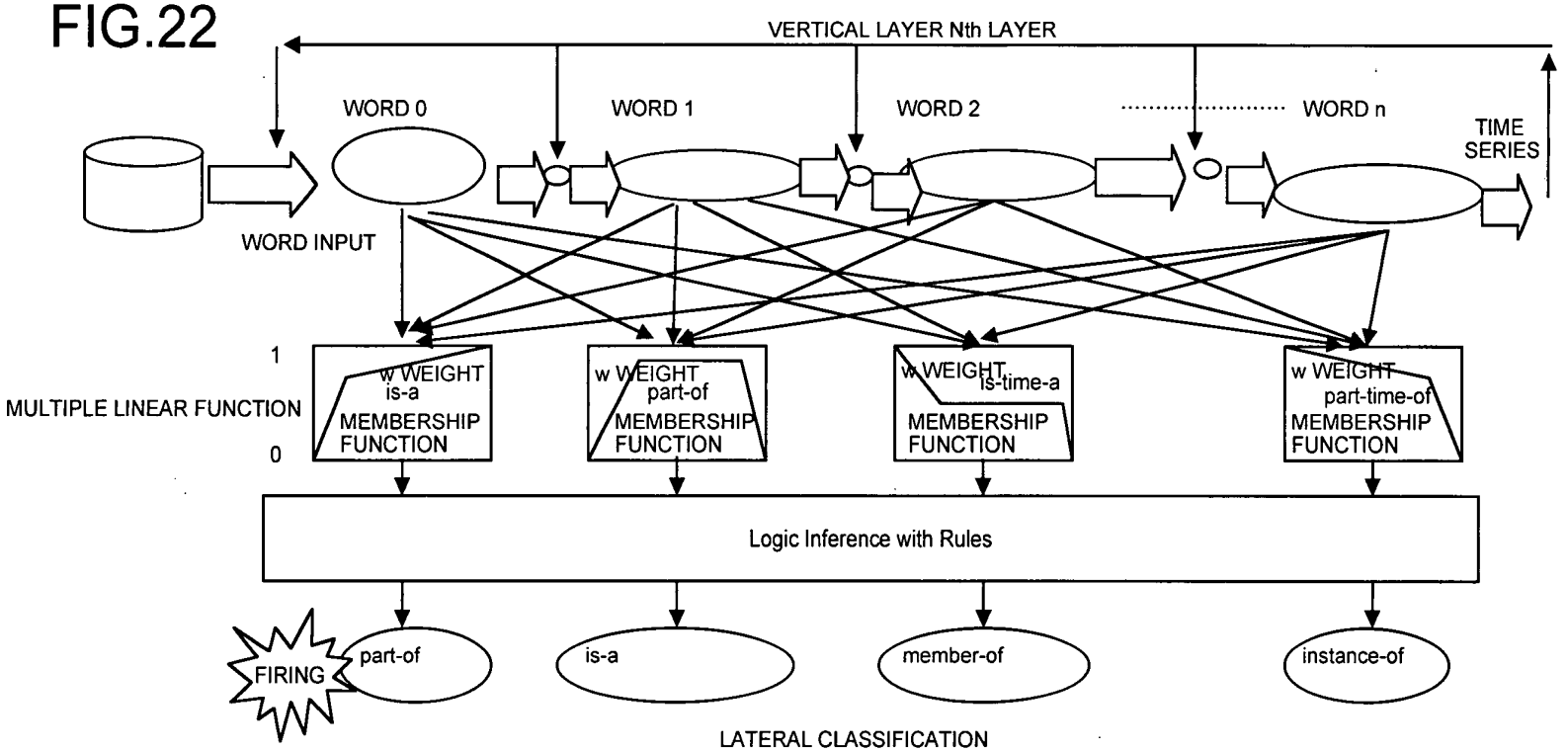

http://www.xxxxxxxxx-xx.com/imode/index.html
RKF
●!NFORMATION new!6/23
1.MESSAGE new!6/23
2.NEWS new!6/21
LINKING

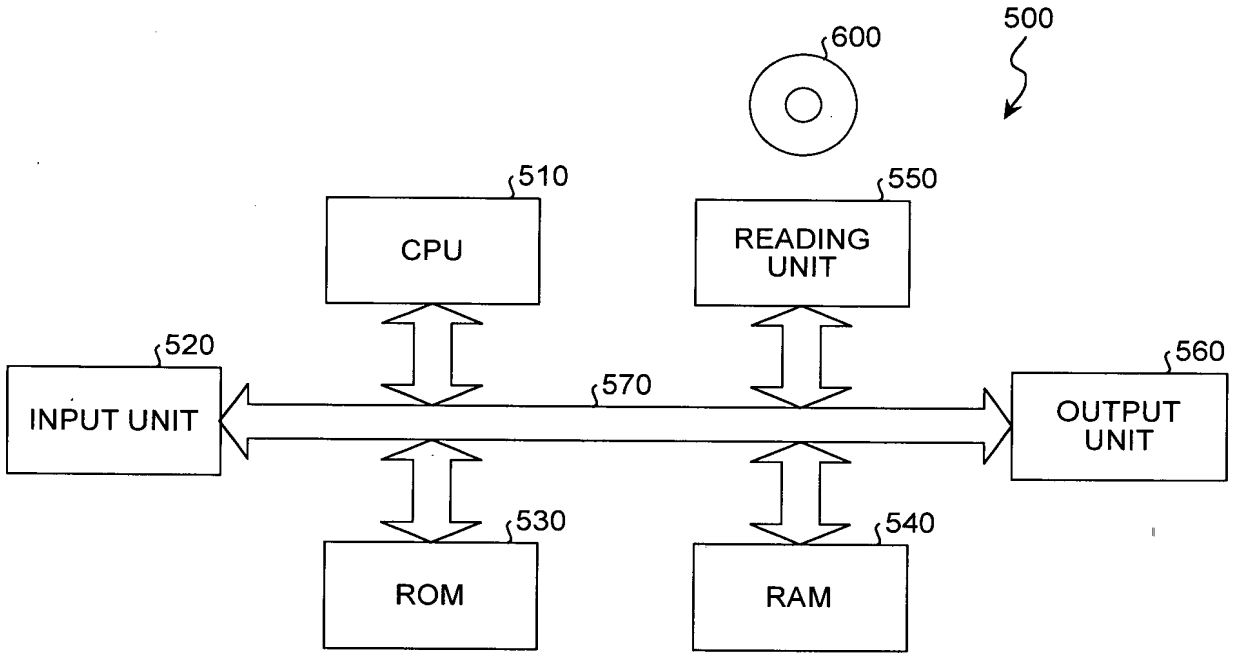
FIG.22



Example (Simulation)

	t0	t1	t2	t3	t4
Top Level					
w00	Server				
w01	Locker	Server			
w02	power supply	Locker	Server		
w03	PCB00	power supply	Locker	Server	
w04	PCB01	PCB00	power supply	Locker	Server
w05	Microprocessor	PCB01	PCB00	power supply	Locker
w06	Flash Memory	Microprocessor	PCB01	PCB00	power supply
w07	Cooling fan	Flash Memory	Microprocessor	PCB01	PCB00
w08	heat sink	Cooling fan	Flash Memory	Microprocessor	PCB01
w09	pipe	heat sink	Cooling fan	Flash Memory	Microprocessor
		pipe	heat sink	Cooling fan	Flash Memory
			pipe	heat sink	Cooling fan
				pipe	heat sink
					pipe

FIG.23


500
600
510
CPU
550
READING UNIT
520
INPUT UNIT
570
560
OUTPUT UNIT
530
ROM
540
RAM